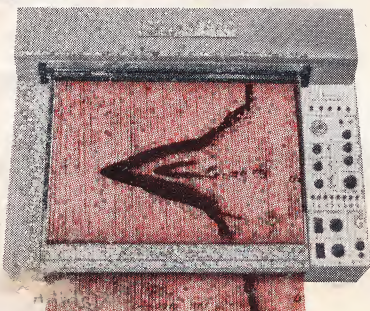
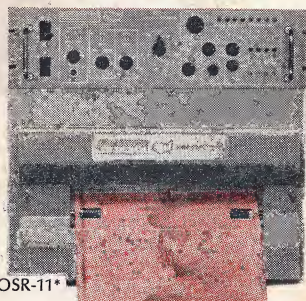


OCEANOGRAPHIC SURVEY RECORDERS



SERIES OSR-19*



SERIES OSR-11*

The basic Oceanographic Survey Recorder-19 available with or without integral sonar transceiver has many features, new to Oceanographic recording — added to achieve a more powerful instrument for modern critical research requirements. Some of these features include: variable cycle length programming to permit separation and collation of desired data from strong interfering signals, a wide range of scanning rates from 20 to 2000 fathoms (40 to 4,000 meters), variable paper feed ratios to assure uniform data with all programming combinations, and a capability of simultaneous magnetic tape recording. For reliability, scale changes, programming and paper feed rate changes are accomplished electronically eliminating bulky and complex gear trains and cam switches. The recorder has excellent sensitivity using Alfax recording paper providing color, stability, cleanliness, simplicity and a wide range of printing shades. The recorders have improved performance and life using Alden patented features of: paper seal-off to prevent annoying paper drying and an endless loop electrode for more consistent and longer life recording. All of these advanced unique features provide high fidelity recordings comparable to units of a much higher price. Prices start at \$3200 for basic OSR-11 and \$4900 for basic OSR-19.

*formally known as Series GDR

Precision Sonar Transceiver

Newly designed ESRT-66 provides all silicon transistors, increased transmitter power to 1600 W automatic overload protection, load matching selector and choice of frequency from 2KC — 30KC. All solid state programmer.



OCEAN SONICS INC

OCEANOGRAPHIC INSTRUMENTATION & DISPLAY



125 Lomita Street, El Segundo, California 90245
Telephone: (213) 322-6881 — 772-1461

Subsidiary of ALDEN ELECTRONIC & IMPULSE
RECORDING EQUIPMENT COMPANY, INC.

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OCEANOGRAPHIC INSTRUMENTATION & DISPLAY

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125 LOMLEY STREET
NEW BEDFORD, MASSACHUSETTS
01945
TELEPHONE (415) 422-0881

INSTRUMENT DATA SHEET

OCEANOGRAPHY

Ocean Sonics, newly formed subsidiary of Alden is devoted to excellence in Oceanographic Instrumentation—offering modern reliable designs in standard sonar recorders and associated sonar instruments. Additionally, Ocean Sonics builds special customer systems utilizing standard tested components.

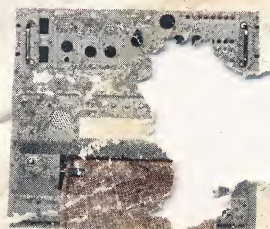
RECORDING SYSTEMS



OSR-19

The **OSR-19** is a 19 inch solid state oceanographic recorder with extensive use of commercial integrated circuits providing a truly up-to-date version of the time-tested Alfax paper recording process with its advantages of color, stability, cleanliness, simplicity, and wide dynamic range of printing tone shades. The OSR-19 model is the basic recorder which can be combined with the variety of transducers such as the sparker, popper, thumper, and boomer for profile studies. The OSR-19 model includes an integral sonar transceiver with programmer (has features as described under ESRT-66).

New features: **Electronically Controlled** for flexibility, variable cycle programming, permitting separation and collation of desired data from strong interfering signals such as surface reflections, multiple echoes, scattering layers etc; wide range of scanning rates from 20 to 2000 fathoms with metric scales available; four chart advance rates from 50 to 250 lines to the inch with step paper feeds for program cycle length being variable for record integration. The frequency response of the OSR series recorders is from DC to 50 KHz ± 2 db. Predecessor GDR 19 is available.



OSR-11

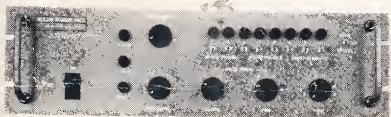
The **OSR-11** is a solid state oceanographic recording instrument which has the same operating characteristics as the OSR-19 but with scan rates from 10 fathoms to 1000 fathoms across 11" of chart paper and can be mounted in a 19" instrument rack or a small mobile console for small craft or for deep submersible applications where space requirements are at a premium. The four (4) paper feed chart advance rates are from 50 to 250 lines to the inch with step paper feeds for program cycle length being variable for record integration. Frequency responses for signal processing from DC to 50 KHz. The OSR-11 is the basic 11" recorder with associated operating controls. Combined with a programmer it becomes OSR-11-P or combined with the programmer/transceiver becomes an OSR-11-T with features as described under ESRT-66. If power requirements are limited, the OSR-11 series recorders can be modified to operate off to battery power supplies thus lending this unit for complete mobile survey applications.

TRANSCEIVERS



ESRT-6

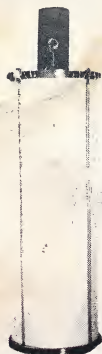
The **ESRT-6 Precision Sonar Transceiver** with a transducer and a companion graphic recorder such as the OSR-19 or OSR-11 forms a precision echo sounding system for precision bathymetry and Oceanographic surveys. The ESRT-6 provides selection of transmitting power in 8 discrete steps from 400 to 1600 watts of power. The output stage is overload protected and transistors will not be damaged in case of sudden changes in load. The design load impedances are 100 to 400 ohms with other matching impedances available upon request. Standard operating frequency of this unit is 12 KHz ± 100 Hz with frequencies from 1 KHz to 30 KHz available upon request. Pulse length also is electronically controlled from 30 microseconds (1 cycle) to .4 seconds. The receiver portion is variable with maximum gain of 120 db with output impedances of 500 ohms. Bandwidth varies automatically to match the pulse length. Overall sensitivity of the receiver portion is .5 volts to 3 microvolts according to the bandwidth (pulse length) with a headphone output converted to 2 KHz for adequate audio hearing.



ESRT-66

The **ESRT-66** is a **Precision Sonar Transceiver** combining the features found in the ESRT-6 but with the addition of an integrated programmer. The programmer permits separation and collation of desired data from strong interfering signals such as surface reflections, multiple echoes, and scattering layers, etc. The unit is all solid state and includes automatic switching, gating, and variable cycle length up to 8 positions (or multiple any interval combination up to 8). The transmitting and receiving characteristics are the same as the ESRT-6.

TRANSPONDERS



XPD-1

The **XPD-1** is a transponder with self-contained power frequency interrogate. Operating depth—0 to 5000 ft. -2° to $+35^{\circ}$ C. The life factor against corrosion is continuous immersion in sea water. The interrogate frequency is 11.0 and 12 KHz with any one of four frequencies available. The threshold is between 0 db/microhar to -20 db/microhar. Provisions for internal sensitivity adjustment are provided with the exception of the 12 KHz mode which is a fixed threshold. The response pattern is omnidirectional (except for angles to access). Vertical beam. The active element is Titanium Zirconium. The transponder is interrogated at 12 KHz with source level of -10 db/microhar. The response is accomplished by receiver after integration. The pulse length is four milliseconds dead time between start of reception and interrogation.

Note: The XPD-1 has undergone

Write or call Alden

ALDEN

ELECTRONIC

& IMPULSE RECORDING EQUIPMENT CO. INC.

Alden Research Center



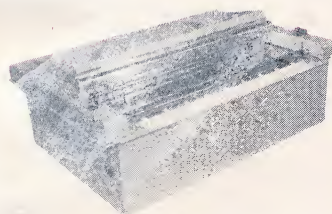
WESTBORO, MASS. 01581
TEL. (617) 366-4467

INSTRUMENT DATA SHEET

OCEANOGRAPHY



OBSS Record



319DA-DC

COMPONENT RECORDERS

ALDEN/ALFAX RECORDING TECHNIQUES provide unique instant graphic display for "side looking", bottom scanning and vertical positioning sonar systems.

Alden component helix recorders are being utilized in various new oceanographic research projects where real time, hard copy displays are required with recording speeds exceeding 600 in./sec. Because of great flexibility of choice in regard to physical size, printing width, resolution, direction and type of scan, each system can be customized for special requirements. Underwater research vehicles such as **ALVIN**, **TRIESTE**, **DEEP STAR**, and **ALUMINAUT** have employed special Alden recorders.

As an outstanding example, Westinghouse's Ocean Bottom Scanning Sonar System employs an Alden dual channel component helix recorder, with each channel scan starting in the center of the chart and proceeding to left and right out to chart margin. This unit provides a "plan view" of the ocean bottom with further enhancement by designing the scan angle of the transducer into a non-linear resilient helix to give a linear display. (Resolution from 6' to 6" are obtainable.) The Alfax recording at left illustrates the readout obtained with the OBSS System. Alfax sensitive recording papers match the writing speed requirements of these systems and, in addition to providing an "X, Y" readout, have the broad dynamic tone shade response which gives the observer his "feel" in the high fidelity of the Alfax tonal scale. Alden Catalog No. 319 DA-DC, is available for those desiring to add "side looking" or "vertical positioning" to their sonar system. Each channel has 5" recording width. The unit is complete—external shaft for recording helix are provided for attachment of customers own recording helix. Operated at speeds to 20 scans/second.

RECORDING SYSTEMS

The Alden 419 Precision Graphic Recorder is a dual channel electronic graphic display instrument designed to meet technical criteria of the Woods Hole Oceanographic Institution. It is equipped with stereo (dual channel—dependent) electronic for signal processing simultaneously from 2 separate inputs and can correspondingly record and display two separate data channels side-by-side across 19" of recording paper for resolution of the data inputs. In addition, either of the two channels can be isolated and expanded across the full 19" printing width if desired. The 419 Precision Graphic Recorder has depth rates from 3000 to 20 fathoms, 5 chart advance rates from 32 to 384 lines per inch for variable resolution/integration, automatic and manual programming for each channel of any one discrete interval in up to 12 intervals.

The 418 Precision Survey Graphic Recorder was designed and developed to operate with existing echo sounding systems which may already be aboard. The 418 PSGR is a 19" transistorized acoustic graphic recorder having alternate use (with the Alden 421B facsimile converter) as radio weather chart recorder operating at either 60 or 120 rpm and index of cooperation of 576 (CGR). The 6 depth rates are 100 to 4000 fathoms. The recorder features manual depth interval selection (gating), five chart advance rates from 32 to 384 lines per inch, digital chronometer for precise time reference, photo/optical scale line generation and "push to mark" event marker.

GRAPHIC COMMUNICATIONS OR WEATHER CHART RECEPTION

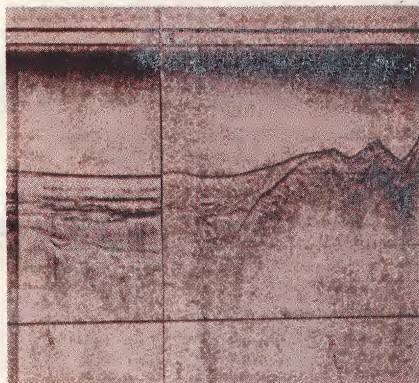
The 519 Series Marine Radio Facsimile Recorder, with a simple switch selection, operates at recording speeds (60, 90, 120 scans/min.), with two chart advance rates of 48 and 96 lines per inch. This capability enables you to record weather data transmitted from any radio facsimile station in the world. The recorder automatically starts and stops upon receipt of 300 cycle "start" and 450 cycles "stop" tone and phases automatically. Marine radio facsimile charts are also provided. The input signal of 1800 to 2400 cycle AM is compatible with all HF radios/converters. If existing radio equipment is available, the Alden 519 Series can be provided with receiver/converter as a separate unit.

The 9165-D-M 9" Flat Copy Scanner is the Marine version of the scanner used for the continuous transmission of weather chart graphics by the Navy and U. S. Navy. With this scanner on board ship, the oceanographic station may transmit, via radio, any type of graphic data—echo soundings, instrument charts from bathythermographs and magnetic charts etc.—any graphics of any size. The scanner operates at two chart advance rates—48/96 lines per inch and sends out control signals which size and stop Alden facsimile recorders automatically at remote locations receiving point is aboard the same ship, then the transmission can be made over internal communications circuits. The method of transmission can be by radio (frequency shift key) or by land line. Standard shipboard transmitters/converter can be equipped with suitable converter for use with the scanner.

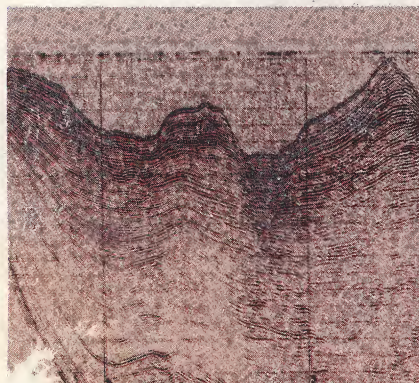
Write or call Marine Division (617) 366-4467

OCEANOGRAPHIC SURVEY RECORDER

Acoustic Recording Applications



BOTTOM & SUB-BOTTOM PROFILING



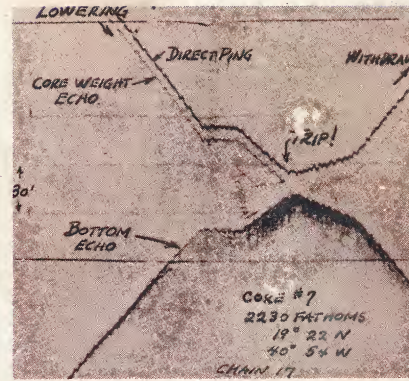
BIOLOGICAL SEISMIC PROFILING



BIOLOGICAL & OCEANOGRAPHIC STUDY



LOCATION & SEARCH



INSTRUMENT POSITIONING

Including Integral Transceiver



OSR-19T Recorder

These high fidelity recordings were made possible through the use of Alfax Instrument Grade Recording Papers

OCEANOGRAPHIC INSTRUMENT & DISPLAY

SUBS. AR.



125 Loma Street
El Segundo, California 90245
Telephone: (213) 322-6881

ELECTRONIC & IMPULSE RECORDING EQUIPMENT CO., INC.

WESTBORO, MASS. 01581

DESCRIPTION

The OSR series of graphic recorders with or without built-in transceivers represents the latest general purpose oceanographic survey recorders. There are two models available in 19 inch recorders. The OSR model is a basic recorder which can be combined with a sparker, or the like, for broadband profile studies, or with standard sonar transceivers to form a high-performance general purpose survey recorder for echo sounding, etc. The OSR-T model includes an integral sonar transceiver and can be operated either as a recorder alone or a complete echo sounder. This model can be supplied to give the user output frequencies from 3.5 kHz to 34 kHz — the standard OSR-T operates at 12 kHz. Both recorders utilize Alfax 19 inch Electrosensitive Recording Paper. Many new features have been added to achieve a more dependable instrument for modern critical research requirements. Standard in this recorder are such new features as the incorporation of the continuous loop electrode eliminating wearing and pitting of the printing electrode as experienced in older models with the reciprocating blade. This new feature produces a sharper and clearer record never before obtainable with this type recorder.

ALFAX:

Alfax Electrosensitive Recording Papers can be stored for an unlimited time under all conditions without affecting the use of the paper. The recordings can be marked upon and erased with ease without the transfer or smudging of recorded information. The cleanliness of recordings makes handling by the user simple and clean. No fumes are generated in recording with Alfax and there is no RFI. Records generated using Alfax are permanent and have a wide dynamic tone shade range to match the fidelity of received signals.

FLEXIBILITY:

Variable cycle length programming capability is standard with all units. This permits separation and collation of desired data from strong interfering signals such as surface reflection, multiple echoes, etc. This is an absolute necessity when attempting to observe the fine structure of echoes at great distance when the recorder scanning rate greatly exceeds the echo transit time.

A wide range of sweep rates is provided, all the way from 20 to 2000 fathoms (40 to 4000 meters). Sweep rates of special scales are available upon request.

Variable paper feed ratios assure uniform data with all programming combinations, and a unique programmed paper feed option feeds the paper with instantaneous start and stop only during the actual writing cycles of the recorder, thus obtaining well spread out but uniform records with the most irregular programming patterns.

The capability of simultaneous magnetic tape recording and subsequent playback into the recorder is standard. Also, any number of recorders can be slaved to a master operating on the same or different sweep rates.

RELIABILITY:

Scale changes, programming, and paper feed rate changes are accomplished electronically through switch selection. All solid state devices including a new sonar transmitter rated at 800 watts with full overload protection is standard. The advancement of the state of the art through the use of integrated circuits is extensively used in the OSR series recorders. These advancements reduce the number of printed circuit cards by one-half and give greater reliability and ease of maintenance/logistics through the stocking of fewer spare cards.

ECHO MONITORING SPEAKER

BFO converted transceiver echoes are directly observable audibly here, assisting in programming setups and observations. Headphone output is also provided.

PAPER FEED CONTROLS

Rotary switch selects number of scans per line width. All electronic switching for instantaneous action while running. The toggle switch controls the nature of the paper feed. In "cont" mode, the paper is fed continuously and uniformly. In "auto" mode, the paper feed is controlled by the program set up on the program switches so that the paper moves only during the "receive" scan cycles.

SCALE LINE CONTROLS

Darkness control varies scale line darkness. These lines are automatically positioned correctly on the chart without the necessity of repositioning after changes in sweep scale. The toggle switch assists in synchronizing the precision 5-minute scale line breaks with the ship's chronometer. In the "hold" position the lines print until the next break occurs, at which time the scale lines stop. When ready the switch is thrown to the "run" position, and the lines start immediately and break every 5 minutes thereafter.

KEYING CONTROLS

Rotary switch controls the pulse length electronically in terms of inches length on the sweep scale used. Toggle switch controls pulse position, either edge or center.

PROGRAM SWITCHES AND LIGHTS

Row of indicator lights tells which toggle switch is in control during any given scan cycle. This light moves from left to right one step with each recorder scan, and returns to the left at the end of the cycle length determined by the cycle length switch. The toggle switches control the function for each scan, either keying while gating the writing (up), gating both the keying and the writing (center), or gating the keying and writing the record.

SWEEP CONTROLS

Start-stop rocker switch. Rotary switch selects depth scale increment, from 20 to 2000 fathoms.

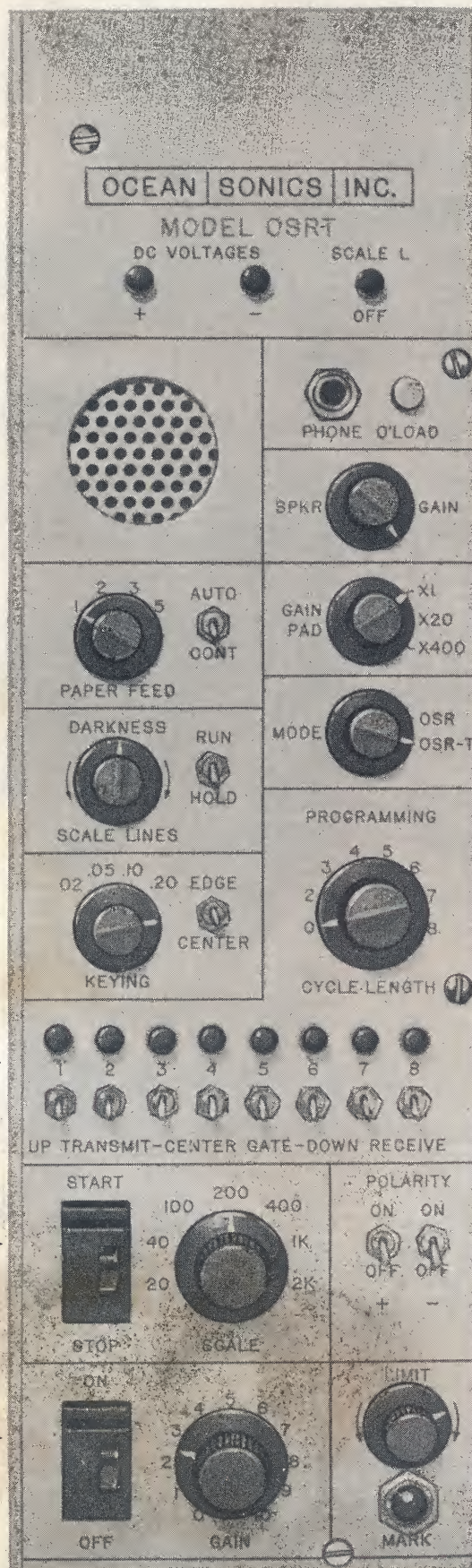
MASTER CONTROLS

On-off rocker switch. Wide range master gain control.



ALFAX
ELECTRONICS

CONTROL PANEL LAYOUT



INDICATING LIGHT

Monitors the DC voltages and shows the off time of the scale lines.

* OVERLOAD INDICATOR

Light indicates when transmitter is overloaded due to transducer short, mismatch, etc. Phone jack for earphone monitoring.

The overload circuit on this model has instantaneous response to overload conditions and recovers in a few milliseconds after the overload is cleared. No waiting period is necessary. The transmitter is ready to supply full power in the next sweep.

* SPEAKER GAIN

Control varies speaker and headphone volume.

* GAIN PAD

Effective when using the internal sonar transceiver. Varies the receiving sensitivity in coarse steps to provide for echo strength variations outside the range of the main gain control.

* TRANSCIEVER-RECORDER MODE SWITCH

Selects instantly between operation on the internal transceiver or external profiling system.

PROGRAM CYCLE LENGTH

Rotary switch controls the program cycle length, or the number of scan cycles which occur before the program returns to the left-hand end of the program. In the "C" position the keying and writing occur on every cycle for unprogrammed operation.

POLARITY SWITCHES

Used with the recorder mode only, these switches select whether positive or negative (or both) signals are written on the record.

LIMITING AND MARKING

Limit control is set to prevent "burning" of the record. Need not be reset normally when switching depth scales. Event marking button included.

*OSR-T Model only

MAINTAINABILITY:

All the electronics are on plug-in circuit cards firmly mounted in card file fashion. Modular construction with all modules connected together via multi-pin connectors for instant replacement is incorporated as standard design. Servicing of the OSR can be supplied through the network of Alden-authorized service representatives and Alden service centers on the East, West, and Gulf Coasts. In addition, service arrangements through a cooperating service organization can be made to service the OSR at various ports of call overseas.

SPECIFICATIONS

OSR-19 and OSR-19T RECORDER

OSR-19

Printing Width:	19 inches wide
Sweep Scales:	20, 40, 100, 200, 400, 1000, 2000 fathoms (scales in meters or time available)
Scale Lines:	20 scale markers across record, with short scale line break every 5 minutes
Time Base Stability:	1 part per million
Printing Electrode:	Continuous loop electrode—motor driven for extended electrode life
Input Sensitivity:	0.2 volts rms for full darkness, frequency response DC to 50 kHz
Key Pulse Lengths:	.02, .05, .1, .2 inches of record
Paper Feed Ratios:	1:1, 1:2, 1:3, 1:5, blade width per sweep
Program Cycle Length:	variable from 2 to 8 steps
Recording Paper:	Alfax Electrosensitive, Type A, 19" wide by 100 ft. roll

OSR-19T with BUILT-IN TRANSCEIVER

Transceiver Overload:	Indicator lamp shows short circuit or mismatch
Audio Indication:	Speaker and headphone volume control for monitoring input signal
Transceiver Sensitivity:	30 microvolts for full darkness
Transceiver Output Power:	800 watts peak power, overload protected, adjustable in 7 steps
Transceiver Output Impedance:	variable 100 to 250 ohms (others on request)
Transceiver Bandwidth:	matched to key pulse lengths
Transceiver Operating Frequency:	12 kHz is standard, 3.5 kHz to 34 kHz frequencies are available

OPERATING REQUIREMENTS AND SIZE

Input Power:	90 to 140 volts AC, 45 to 70 Hertz
Power Consumption:	100 watts
Weight:	85 pounds
Size:	height 9", width 28", depth 21"
Military Specifications:	Mil-E-16400F used as a design objective and the OSR-G Model meets Mil-I-16910 for RFI
Accessories/Spares:	Kit #OSRKA which includes manual, recording paper, loop electrodes, bands, etc., is supplied with each OSR recorder

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